Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_

**DNA History and Structure Worksheet**

Ms. Ottolini, PreAP Biology

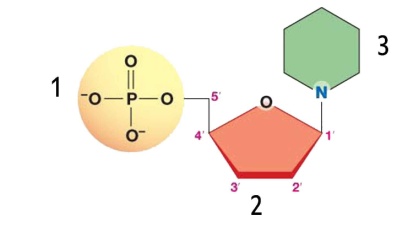
***Matching:*** *Write in the letter that corresponds to the term from the word bank that correctly completes each statement.*

|  |  |  |
| --- | --- | --- |
| A. 3’ | G. Adenine | M. Nucleotides |
| B. 5’ | H. Thymine | N. Complementary Base Pairing |
| C. Pyrimidines | I. Cytosine | O. Backbone |
| D. Purines | J. Guanine | P. 5-Carbon Sugar (deoxyribose) |
| E. Nucleotides | K. Hydrogen Bonds | Q. Phosphate Group |
| F. Watson and Crick | L. X-ray crystallography | R. Nitrogenous Base |
|  |  | S. Rosalind Franklin |

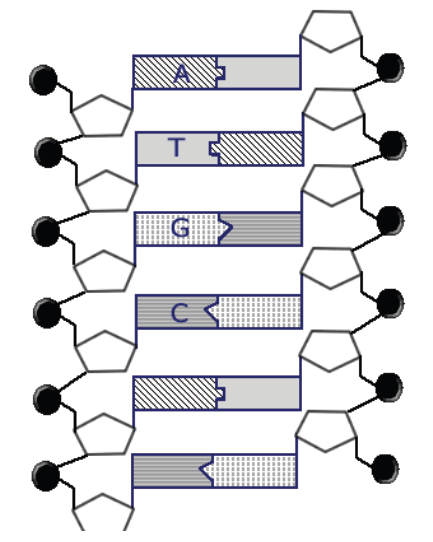
1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ determined that the basic structure of DNA—or deoxyribonucleic acid—is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ data from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to support this conclusion.
2. DNA is made of monomers called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Each nucleotide is made of three parts a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. There four different nitrogen bases found in DNA. They are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Sugars and phosphate groups make up the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of each DNA strand (the sides of the ladder).
6. Nitrogen bases connect together across the double helix using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (a weak type of bond) to form the rungs of the DNA ladder.
7. The phosphate end of the sugar-phosphate backbone is considered the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ end of the strand.
8. The sugar end of the sugar-phosphate backbone is considered the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ end of the strand.
9. Because the two DNA strands (the sides of the ladder) run in opposite directions from one another (i.e. one from 3’ to 5’ and the other from 5’ to 3’), scientists say that the two strands are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
10. Adenine and guanine are examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, nitrogen bases with a double-ring structure.
11. Thymine and cytosine are examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, nitrogen bases with a single-ring structure.
12. Erwin Chargaff found that there were equal amounts of adenine and thymine and equal amounts of guanine and cytosine in a DNA molecule. He concluded that adenine/thymine and guanine/cytosine pair together across the DNA double helix. The idea that certain bases always pair together is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

***Labeling/Analyzing Images:*** *Follow the directions next to each picture.*

1. Label the following parts of the nucleotide pictured below: sugar, phosphate group, and nitrogen base



1. Label the following parts of the DNA double helix pictured below: sugar, phosphate group, nitrogen base, 5’ end (of both strands), 3’ end (of both strands), hydrogen bond(s).
2. Circle a single nucleotide on the DNA double helix pictured below.
3. Label the “blank” nitrogen bases with the letter that corresponds to the “complementary base.”



1. What conclusion did Hershey/Chase draw from their virus experiment? Explain your answer by referring to the picture below, which details the steps of the experiment.

